REMARKS

Applicants note that the Examiner has considered the arguments with respect to claim 1 and now considers them moot in view of the new grounds of rejection.

The Examiner now rejects claims 1 and 2 under 35 U.S.C. 103(a) as being unpatentable over Esposto US Patent No. 5,743,325 in view of Yee US Patent No. 6,478,258. The Examiner states that in Esposto there is disclosed Applicants' invention as claimed with the exception of providing one or more heat pipes that cross couple opposite facing payload radiators.

Further, the Examiner states that Yee discloses a spacecraft multiple loop heat pipe thermal system for internal equipment panel applications that provides one or more heat pipes that cross couple opposite facing payload radiators (see column 2 lines 25-30). Therefore, the Examiner concludes, it would be obvious to modify Esposto's invention by providing one or more heat pipes that cross couple opposite facing payload radiators in order to increase the cooling process.

Applicants respectfully submit that in Esposto '325 there is disclosed "a closed-loop heat pipe transport design for a deployment application having a flexible section which connects to a payload structure and a deployable structure. The flexible section folds over itself while the deployable structure is stowed. Upon rotation of the deployable structure around a predetermined axis, the flexible section unfolds, with a portion of the flexible section passing through the predetermined axis. When the deployable structure has completed its rotation and is fully deployed, the components of the flexible section will lie in substantially the same plane."

Applicants gratefully acknowledge, as the Examiner admits, that Esposto does not disclose providing one or more heat pipes that cross couple opposite facing payload radiators and is distinguishable from Applicants' instant claims and on least this basis.

Applicants respectfully submit that in Yee '258 there is disclosed "a loop heat pipe cooling system for use on a spacecraft. The loop heat pipe cooling system has loop heat pipes routed from internally facing surfaces of one or more internally located equipment panels to externally located radiator panels. Heat is collected at evaporator ends of each loop heat pipe and transported to condenser ends of the respective loop heat pipe. The condenser ends of the loop heat pipes may either be embedded within the radiator panel or externally mounted and coupled to the radiator panel using a loop heat pipe condensing flange. Fixed conductance heat pipes may also be used in any or all of the internal panels and radiator panels in order to collect and distribute heat loads to and from the loop heat pipes."

Further, in Yee '258 it is stated at column 1, lines 26 et. seq. that "The present invention provides for a loop heat pipe cooling system that provides efficient thermal pathways between spacecraft equipment mounted on any number of internal equipment panels to a combination of multi-directional facing radiator panels. Loop heat pipes employed in the cooling system may be routed from the internal equipment panels to one or more radiator panels in order to optimize spacecraft heat sharing between radiator panels. This improves the overall efficiency of the radiator panels.

Loop heat pipes are similarly distributed and routed for each of the internally located equipment panels, although this is not an absolute requirement. Heat is collected at evaporator ends of each loop heat pipe and then transported to condenser ends of the loop heat pipes.

The condenser end of each loop heat pipe may either be embedded within the radiator panel so as to provide a direct condensing loop heat pipe radiator panel or externally mounted to the radiator panel as a loop heat pipe condensing flange. Fixed conductance heat pipes may additionally be used in any or all of the internal panels and radiator panels in order to collect and distribute heat loads to and from the loop heat pipes.

Applicants respectfully submit that although in Yee '258 it is clearly seen that loop heat pipes are similarly distributed and routed for each of the internally located equipment panels, this is not an absolute requirement. Heat is collected at evaporator ends of each loop heat pipe and then transported to condenser ends of the loop heat pipes. Thus, it is seen that the heat is collected at the evaporator ends of each loop heat pipe and then transported to the condenser ends of the same loop heat pipes and nowhere are said loop heat pipes disclosed or taught cross coupling opposite facing payload and deployable radiators as found in the instant claims.

Applicants respectfully contend that Yee '258 neither teaches, suggests or implies a spacecraft radiator system of the instant invention wherein one or more coupling heat pipes are cross coupled to opposite facing payload and deployable radiators. Such a teaching is conspicuously absent in both Esposto and Yee and Applicants respectfully submit that it would not be obvious as the Examiner contends to modify Esposto's invention by providing one or more heat pipes that cross couple opposite facing payload radiators in order to increase the cooling process as in Yee, since Yee clearly does not teach one or more coupling heat pipes that cross couple opposite facing payload and deployable radiators as in the invention of the instant claims.

Furthermore, Applicants respectfully contend that nowhere in Esposto is there any suggestion, as previously recited, that one or more coupling heat pipes may be employed to cross couple opposite facing payload and deployable radiators as in the instant invention.

Applicants respectfully conclude that Yee '258 does little to cure this deficiency and may not properly be combined with Esposto '325 since Esposto is primarily directed to a closed loop heat pipe transport design for a deployment application having a flexible section which connects to a payload structure and a deployable structure while Yee '258 is directed to a loop heat pipe cooling system routed from internally facing surfaces of one or more internally located equipment panels to externally located radiator panels.

Applicants respectfully submit that in Yee '258 it is seen that heat is collected at the evaporator ends of each loop heat pipe and transported to condenser ends of the respective loop heat pipe and not to one or more coupling heat pipes that cross couple opposite facing payload and deployable radiators as in the claims of the instant invention.

The Examiner has rejected claims 3, 4, and 5 under 35 U.S.C. 103(a) as being unpatentable over combined teachings of Esposto US Patent No. 5,743,325 and Caplin US Patent No. 5,806,800. The Examiner states that Esposto discloses the Applicants' invention as claimed with the exception of providing a body and a plurality of solar arrays.

The Examiner goes on to state that Caplin discloses a dual function deployable radiator cover that provides a body 12 (see figure 1) and a plurality of solar arrays 18 (see figure 1). Therefore, according to the Examiner, it would be obvious to modify Esposto's invention by providing a body and a plurality of solar arrays in order for the invention to function properly.

Applicants again refer the Examiner to the distinctions drawn above with regard to the Esposto reference including, but not limited to, the exception as noted by the Examiner of providing one or more heat pipes that cross couple opposite facing payload radiators, as found in the instant claims which are hereby respectfully incorporated by reference.

Applicants respectfully submit that in Caplin '800 there is disclosed a dual function deployable radiator and radiator cover for use on a communication satellite. A deployable radiator is folded or in a "stowed" configuration over a fixed radiator when a satellite is in a launch vehicle. The deployable radiator thereby serves as insulation for the satellite when heat rejection is not necessary. When heat rejection becomes necessary, the deployable radiators are deployed whereby unwanted heat is rejected from the satellite. The deployable radiators, therefore serve a dual purpose, functioning as insulators for part of a mission and radiators for the remainder.

As may be seen clearly in figures 2 and 3 in Caplin '800 the payload radiators are connected to deployable radiators on the same side of the satellite and not on opposite sides of the satellite which does not satisfy the significant limitation of the claims of the instant invention.

At column 3, line 35 et. seq. there is disclosed "There are fixed and deployable radiators on a payload structure 36. Typically, fixed radiators are employed on the sides of

"the satellite. Up to four deployable radiators may be located on the exterior of the satellite, each connected to the payload structure by (1) a hinge and (2) a means for transferring heat generated by heat dissipating elements in the payload module to the deployable radiator."

Applicants respectfully submit that this connection is seen to be a deployable to payload radiator configuration clearly on the same side of the satellite. Further, in figure 3 of Caplin '800, Applicants respectfully submit there is an illustration showing deployable radiators 62, 64, 66, 68 in the deployed position; and fixed radiators 70, 72 which are exposed upon deployment of the deployable radiators. Before deployment, the deployable radiators 62, 64, 66, 68 cover the fixed radiators 70, 72 and serve as insulators for the satellite. After deployment, Applicants respectfully submit, the heat rejecting surfaces of the deployable radiators 62, 64, 66, 68 are exposed to space and work to reject unwanted heat from the satellite. The deployable radiators 68, 66 are clearly connected to payload radiators 72 on one side of the satellite while on the other side of the satellite deployable radiators 62, 64 are connected directly to the payload radiator 70 on the other side of the satellite.

Again, Applicants respectfully submit that this is clearly distinguishable from the deployable to payload coupling configuration on opposite sides of the satellite as recited in the claims of the instant invention.

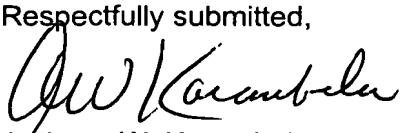
Applicants respectfully submit that Esposto '325 does not teach, suggest or imply the novel system of the instant invention and that Yee '258 or Caplin '800 may not be properly combined with Esposto in any manner to render the claims of the instant invention obvious under 35 U.S.C. 103(a).

Applicants note that the Examiner has stated that the prior art of record and not replied upon is considered pertinent to Applicants' disclosure, but since these references have not been specifically applied, no further comment is deemed warranted with respect to same.

In view of the above remarks, Applicants respectfully contend that all of the claims presently under prosecution contain patentable subject matter and have been shown to be patentably distinguishable over the prior art of record including Esposto '325 in any combination with either of Yee '258 or Caplin '800.

Accordingly, it is respectfully submitted that the above entitled application be reconsidered and reviewed in view of the above remarks and that a Notice of Allowance be issued at any early date.

Respectfully submitted,



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